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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/650,215

08/27/2003

Shahram Mostafazadeh

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08/24/2004

BEYER WEAVER & THOMAS LLP

P.O. BOX 778

BERKELEY, CA 94704-0778

EXAMINER

PAREKH, NITIN

ART UNIT

PAPER NUMBER

2811

DATE MAILED: 08/24/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/650,215

Applicant(s)

MOSTAFAZADEH ET AL.

Examiner

Nitin Parekh

Art Unit

2811

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 28 July 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 13-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 August 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 3.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

**DETAILED ACTION**

***Election/Restriction***

1. Applicant's election without traverse of Group I, claims 1-12 in Paper No. 2 is acknowledged.

***Information Disclosure Statement***

2. The Information Disclosure Statement filed on 02-02-04 has been considered.

***Specification***

3. The disclosure is objected to because of the following informalities:
  - A. Description of the reference numeral/layer 116 covering the photonic device is missing (see Fig. 2).

Appropriate correction is required.

**Drawings**

4. The drawings are objected to under 37 CFR 1.83(a) because they fail to show the reference numeral for the dielectric material supporting the conductive layer (see specification page 5, section 0011), as described in the specification

Any structural detail that is essential for a proper understanding of the disclosed invention should be shown in the drawing. MPEP § 608.02(d). Corrected drawing sheets are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being

amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Claim Rejections - 35 USC § 112***

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. Claim 1 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Claim 1, line 2 cites: "a photonic device exposed on a first surface".

However, as described in the specification and the drawings, the photonic device (see 104 in Fig. 2) is covered by a plurality of layers (see 116 and 106 in Fig. 2) and is not exposed.

***Claim Rejections - 35 USC § 102***

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

8. Claims 1-3, 5, 6-9, 11 and 12, insofar as in compliance with 35 U.S.C. 112, are rejected under 35 U.S.C. 102(e) as being anticipated by Noma et al. (US Pat. Application Pub. 2003/0230805)

Regarding claims 1-3, 5 and 6, Noma et al. disclose a die-level image sensor/opto-electronic device (Fig. 1A) comprising:

- a semiconductor die (2 in Fig. 1A) having edges and a charge coupled (CCD) circuit element/photonic device being electrically coupled to a wiring layer on first/top surface (see 5a in Fig. 1A; sections 0043 and 0044) exposed to an

ambient light through a transparent epoxy layer and an optically transparent glass substrate/laminate (4 and 3 respectively in Fig. 1A; sections 0063 and 0064)

- a conductive structure (see 9a/8 in Fig. 1A) formed in the die and away from the edges of the die
- the conductive structure being exposed on a second/bottom surface of the die that opposes the first surface (see Fig. 1A), wherein the conductive structure is electrically connected to the CCD/photonic device
- the conductive structure having an under bump metallization (UBM) pad/cushion (see 7 in Fig. 1A) attached to the second/bottom surface, the UBM pad/cushion being electrically connected to the conductive structure
- the conductive structure further comprising a solder ball/bump (see 8 in Fig. 1A; section 0073) extending beyond the second/bottom surface, and
- the optically transparent laminate attached to the first surface of the die so as to cover/overlay the CCD circuit element/photonic device

(Fig. 1A; Fig. 4-8B; sections 0040-0049; 0062-0073).

Regarding claims 7-9, 11 and 12, Noma discloses the entire claimed structure as applied to claims 1-3, 5 and 6, above, wherein Noma teaches a plurality of CCD circuit element/photonic devices/dice being formed on a wafer (see Fig. 1A and 4; sections 0040-0049; 0062-0073).

***Claim Rejections - 35 USC § 103***

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 4 and 10, insofar as being in compliance with 35 U.S.C. 112, are rejected under 35 U.S.C. 103(a) as being unpatentable over Noma et al. (US Pat. Application Pub. 2003/0230805) in view of Chungpaiboonpatana et al. (US Pat. Application Pub. 2003/0193078)

Regarding claims 4 and 10, Noma teaches substantially the entire claimed structure as applied to claims 1, 3, 7 and 9 above, except the UBM pad being redistributed so as to occupy a different location on the second surface than the conductive structure.

Chungpaiboonpatana et al. teach a metallization on a surface of a die (see 100 in Fig. 1) where the metallization pattern includes a conventional redistribution structure having conductive solder ball/UBM pad being redistributed and connected to other pads so as to occupy a different location on the surface (see 106 and 102 respectively in Fig. 1) to provide improved grounding, electrical performance and reduced signal noise/degradation (Col. 1-3).

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It would have been obvious to a person of ordinary skill in the art at the time invention was made to incorporate the UBM pad being redistributed so as to occupy a different location on the second surface than the conductive structure as taught by Chungpaiboonpatana et al. so that the electrical performance, grounding and repair/rework capability can be improved in Noma's opto-electronic device.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nitin Parekh whose telephone number is 571-272-1663. The examiner can normally be reached on 09:00AM-05:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Lee can be reached on 571-272-1732. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9318.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

NP

08-22-04



NITIN PAREKH

PATENT EXAMINER

Technology Center 2800